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LISTS OF SPECIES

A checklist of the mammals (Mammalia) from Durango, western Mexico

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ABSTRACT: An updated list of the mammals of Durango state, Mexico was built from literature records and Museum specimens. A total of 139 species have been recorded, representing 28.3 % of the Mexican terrestrial mammals, and 25.1 % species more compared to the previous account. Two species have been extirpated from the state, 23 are endemic to Mexico. Four major ecoregions have been previously defined for the state, Arid, Valleys, Sierra, and Quebradas. Species richness is highest at the Quebradas, a tropical ecorregion, whereas the aridlands are the least species-rich. The Sierra has the highest number of endemic species (11) followed by Quebradas (7), Valleys and Arid (3). Despite the fact that Durango harbors one of the largest diversities of mammals of the country, conservation efforts are minimal, and the current protected areas do not include the most species-rich regions. The current rate of anthropogenic modification in the state makes urgent to put in practice already existing plans to protect Durango's unique biodiversity.

INTRODUCTION

Mexico harbors one of the most diverse mammalian fauna (527 species, 488 terrestrial), surpassed only by Brazil and Indonesia. It also has the second largest number of endemic species worldwide (Bradley *et al*. 2004; Carraway 2007; Ceballos *et al*. 2005, Romo-Vázquez 2005; Tejedor 2006). As with the rest of the world, in Mexico Mammalia is one of the best known zoological groups. Few new species have been described from the country recently, and those new taxa are mostly cryptic species discovered through analysis of DNA sequences. Nonetheless, some areas are better known than others: most mammalian research and inventories have been historically focused on the central and southeastern portions of the country, while less attention has been paid to the northern areas. Durango is the fourth largest state in Mexico (123,314 km^2 INEGI 2005), a landlocked area located in the north central portion of the country (Figure 1). Durango is traversed by the tropic of Cancer from east to west, and by the Sierra Madre Occidental from Northwest to Southeast, both factors resulting in a complex landscape. Moreover, in the Sierra Madre of Durango, as in other parts of Mexico, the Nearctic and Neotropical biogeographic regions meet, thus potentially a larger number of species than expected otherwise may occur within its borders (López-González and García-Mendoza 2007).

Because historically most of the current territory of Durango was not explored by naturalists, prior to the 1880s very few records of its mammalian fauna are available, and usually they are part of historical writings, rather than biological accounts (e.g. de Morfi 1777-1778). The oldest account of the local mammalian fauna we could find is by O. Thomas, who reported a small list of mammals collected in southwestern Durango (Thomas 1882). The mammal list for the state increased slowly in the following century with works by Allen (1903; 1904), Goldman (1951) and Baker (1960). The first state-wide account was published in 1962 (Baker and Greer 1962), and remains to date the only treatise on the mammalian fauna of the state. Following this work, a number of papers on the taxonomy and distribution of Durango mammals have been published (Webb and Baker 1962; Jones 1964; Gardner 1965; Crossin *et al*. 1973; Baker and Baker 1975; Petersen 1976; 1979; Álvarez and Polaco 1984; Houseal *et al*. 1987; Servín *et al*. 1995; Hernández Huerta *in litt*; Muñiz-Martínez and Arroyo-Cabrales 1996; Muñiz-Martínez and Polaco 1996; Servín *et al*. 1996; Servín 1997; Aragón-Piña and Garza-Herrera 1999; Bell *et al*. 2001; López-González 2003; Muñiz-Martínez *et al*. 2003; Servín *et al*. 2003a; Bradley *et al*. 2004; Gómez-Ruiz *et al*. 2006; Carraway 2007; Torres-Morales *et al*. 2010; Charre-Medellín *et al*. 2011). During the last quarter of the 20th century, a group or researchers associated to the only protected areas of the state at that time (La Michilía and Mapimí Biosphere Reserves)

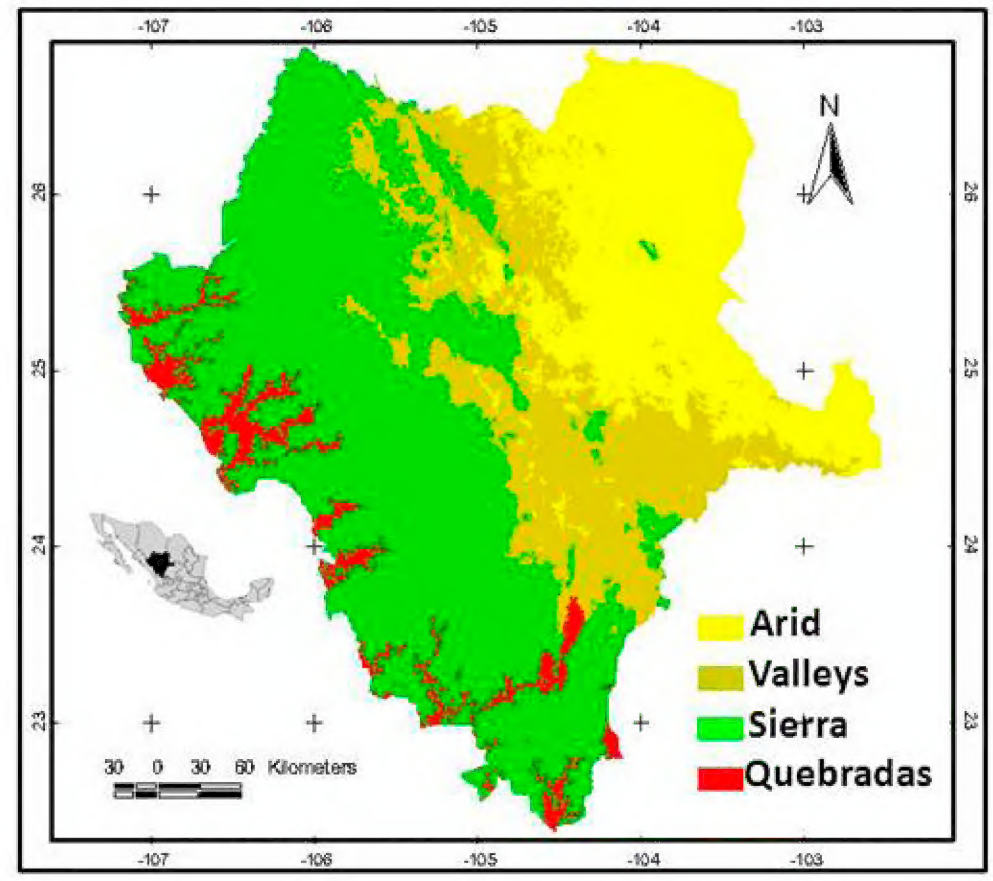

FIGURE 1. Geogeaphic location of Durango State, Mexico, and main ecologial regions (after Gonzaéz Elizondo *et al.* 2007). See text for detailed description of regions.

published the results of numerous research projects, mostly focused on the ecology of the species (Gallina *et al*. 1978; Gallina 1981; Grenot 1981; Gallina y Folliott 1983; Servín 1991; Gallina and Excurra 1992; Servín and Huxley 1991a; 1991b; Servín 1997; Hernández *et al*. 1987; Alvarez *et al*. 1988; Alvarez and Arroyo-Cabrales 1990; Rogovin *et al*. 1991; Servín and Huxley 1993; Hernández and Delibes 1994; López Vidal and Alvarez 1997; Servín, 2000; Servín *et al*. 2003b; González Romero *et al*. 2005; Hernández *et al*. 2005; Servín 2005). Further research has been conducted in other areas of the state, on ecology (Drake 1958; Petersen 1973; 1975; 1978; Petersen y Petersen 1979; Petersen 1980a; 1980b; 1985; Servín 1991; Servín and Huxley 1993a; 1993b; Petersen 1993; Muñiz-Martínez 1997; Servín 1997; Servín *et al*. 2003b; López-González and Torres-Morales 2004; Portales *et al*. 2004; Lopez-González 2005; López-González *et al*. 2010), ectoparasites (Montiel-Parra *et al*. 2001; Villegas-Guzmán *et al*. 2005), and more recently ethnozoology (Jacobo-Salcedo *et al*. 2011). These papers have added a significant number of species to Baker and Greer's (1962) inventory, and have increased our knowledge on the mammalian fauna of Durango. Nonetheless, no updated checklist on the mammals for the state has been published since that account; thus the objective of this work is to present an updated checklist of the mammals of Durango state, with comments on their general distribution.

Materials and Methods

The updated list was built up from Baker and Greer (1962) and Ramírez Pulido *et al*. (2000). We conducted a search in the major internet journal databases for all literature published up to November 2012, using "mammals" and "Durango" as keywords. Additional, previously unpublished records were scored from specimens deposited at the Mammal Collection, CIIDIR-IPN Unidad Durango (CRD); Colección Nacional de Mamíferos, Universidad Nacional Autónoma de México (CNMA); Colección de Mamíferos, Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, México (ENCB); the Museum of Michigan State University mammal (MSU); Natural Science Research Laboratory, The Museum, Texas Tech University (TTU); and the Mammal Collection, Department of Ecology and Evolutionary Biology, University of Kansas (KU). Thus, all records included in this account are based either on specimens examined by us or by published records based on museum specimens. Nomenclature was standardized following Ceballos *et al*. (2005), except for the order Soricomorpha, for which we follow Carraway (2007), the genera *Natalus*, for wich we follow Tejedor (2005, 2006) and *Spermophilus*, for wich we follow Helgen *et al*. (2009). Zoogeographic affinities follow Álvarez and Lachica (1974). Protection status and endemisms are indicated when appropriate following Ceballos *et al*. (2005), current Mexican regulations (SEMARNAT 2010) and IUCN red list (IUCN 2012). We did not include in the checklist introduced or domestic species.

To give general information on the habitat of species, we assigned each species to one or more ecological regions as defined by González Elizondo *et al.* (2007). These authors divided the state into four ecological zones that encompass the major biomes of the state (Figure 1), from east to west they were:

1) Arid and semiarid region - Lowland plains and mountain ranges from the Bolson de Mapimí in the north to the border with Zacatecas in the south. This area is part of the Chihuahuan desert and constitutes the western portion of the Mexican Plateau. Elevations range from 1070 to 2200 m above sea level. Climates vary from dry, to very dry and warm (BWh, BSh, BWh' – Köppen modified by García 1988). Vegetation includes a variety of thorn scrubs, as well as halophylic and gypsophile associations in a few isolated areas.

2) Valleys region - A wide strip of land extending from northwest to southeast between the Chihuahuan desert and the Sierra Madre Occiental Mountains. It includes mostly grasslands, as well as mesas and a few small mountain ranges. Elevation ranges from 1600 to 2400 m, descending northeastwards to the Mapimi desert. Climate is warm and dry, with extreme temperatures throughout the day (BS_1K - González-Elizondo *et al*. 2007) in most of the area. Although originally it was covered with grasslands and mesquite grassland, currently most of this area has been modified for agriculture and cattle ranching.

3) Sierra Region - It includes the Sierra Madre Occidental mountains, from 2400 m above sea level on the eastern slope, and 2000 m on the western slope, to 3340 m on the summits. Climates are temperate, dry on the eastern slope (C(w)) , and more mesic and cooler (C(E)(w)) on the higher portions, González Elizondo *et al.* 2007). Vegetation includes pine, pine and oak forests, open oak forests, as well as secondary chaparral produced by deforestation. Small patches of cloud forest also occur on the highlands of the western slope.

4) Quebradas Region - Lowlands of the western slope of the Sierra Madre Occidental. Elevation ranges from 2000 to 130 m above sea level. The region is rugged, with steep slopes and deep canyons. The climate is warm, with a long dry season and high precipitation (700-1500 mm) in the rain season (AC(w), González-Elizondo *et al*. 2007). Accordingly, the local vegetation consists of tropical associations, such as dry, deciduous, or semidecidous tropical forests, mixed with secondary vegetation resulting from agricultural and cattle ranching activities.

We constructed a checklist including all species and ecorregions for which records were available. Regional faunas were compared via Cluster analysis (UPGMA) of a resemblance matrix based on presence-absence data. Analysis was performed using the SAHN module of NTSYSpc Ver. 2.02 (Applied Biostatistics Inc. 1998) The Jaccard index (Brower and Zar 1977) was used as a distance measure.

Results and Discussion

Species richness

Eight orders, 23 families 77 genera, and 139 species of mammals were recorded from Durango (Table 1), representing 28.30% of the terrestrial mammalian fauna of Mexico. Our list increases the number of species listed by Baker and Greer (1962) in 35 (25.1%).

Species richness in Durango, by order, is what would be expected proportionally (i. e., 28.3% of the Mammals of Mexico) for Didelphimorphia, Cingulata,

and Lagomorpha (Figure 3). Artiodactyla, Rodentia and Soricomorpha are proportionally underepresented; whereas Chiroptera and Carnivora are overepresented. Neither Primates or Perissodactyla occur in the state, as they are restricted to more humid tropical areas of Mexico. Seventy-four percent of the species have Nearctic affinities (Álvarez and Lachica, 1974 and Figure 2). Artiodactyla and Carnivora are orders of holarctic affinities, which explains their abundance in a mostly subtropical area. Bats, on the other hand, are a mixture of nearctic elements from the highlands and Mexican plateau and tropical species from the Pacific coastal plain that penetrate into the Sierra Madre Occidental through the canyons on its western slope. Rodentia might be underepresented due to the absence of tropical species that do not penetrate into the Sierra Madre Canyons, but it is also possible that the area is still not fully explored and species remain undescribed.

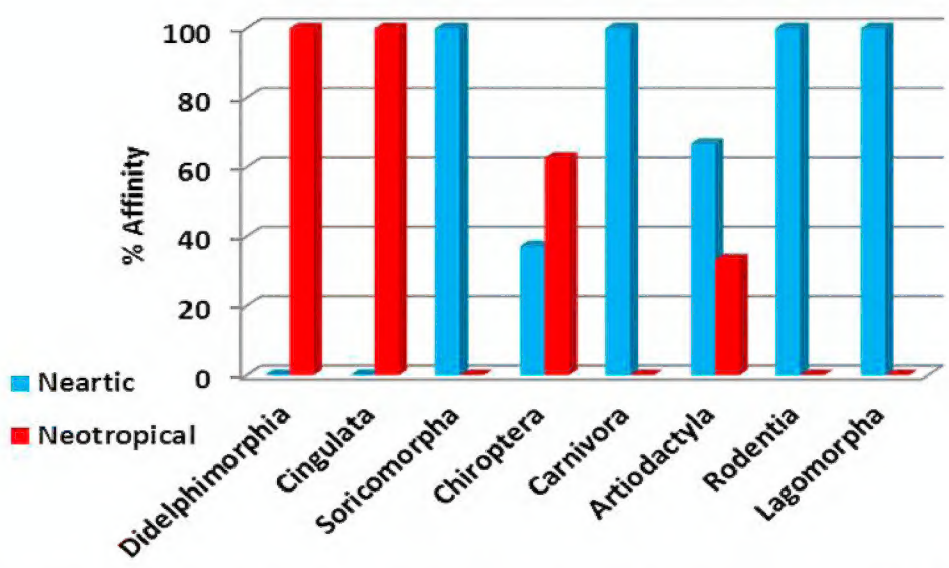

FIGURE 2. Percentage of neotropical and nearctic species, by order, for the mammals of Durango, Mexico. Affinities after Alvarez and Lachica, (1974).

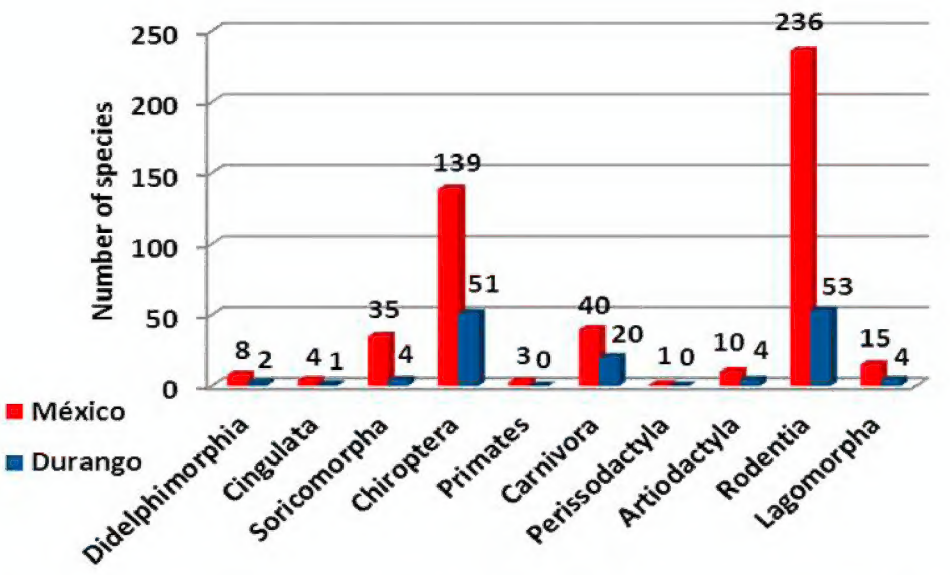

FIGURE 3. Mammal species richness by order for Mexico (red bars) and Durango (blue bars). Data for Mexico from Bradley *et al.* 2004; Carraway 2007; Ceballos *et al.* 2005, Romo-Vázquez 2005 and Tejedor 2006.

Conservation status

Of the 139 species recorded, 23 are endemic of Mexico; most endemics are rodents (16 species), followed by bats (5, Table 1). Twenty are species of concern according to Mexican laws (SEMARNAT 2010): 7 are of special concern for being endemic or migratory, 8 are considered threatened, and 3 are endangered. Under this regulations, the Mexican wolf (*Canis lupus baileyi* Nelson and Goldman, 1929) is considered extinct, but Ceballos *et al.* (2005) considered wolves as extirpated rather than extinct because of successful reintroduction efforts in Arizona, USA (Hedrick and Fredrickson 2008). For Durango, Allen (1942) and Leopold (1959) reported *Canis lupus,* but they did not provide specific localities or specimens to back up their claims. Baker and Greer (1962) on the other hand, collected and examined specimens from Rancho Las Margaritas, near what is today la Michilía Reserve. The last published record we could find for wolves in Durango is by McBride (1980). The grizzly bear (*Ursus arctos horribilis* Ord, 1815) is considered extinct for Mexico by Mexican law (SEMARNAT 2010). As with the Mexican wolf, because wild populations of *U. arctos* still occur in the United States (Wilson and Ruff 1999), it is more appropriate to consider grizzly bears as extirpated from Mexico rather than extinct (Ceballos and Navarro 1991). According to Allen (1942), grizzly bears (under the name *Ursus nelsoni)* were distributed across the Sierra Madre Occidental from the northwestern state of Chihuahua and northeastern Sonora to southern Durango. Subsequently, Hall (1981, 1984) and Moctezuma Orozco (2005) proposed the same distribution in their accounts on grizzly bears. Nonetheless, as far as we could investigate, there are no documented records for this species of bear in Durango, and none of these authors give evidence of their presence or refer to data gathered by other author. The southernmost record for *U. arctos* in México appears to be from Sierra del Nido, in north-central Chihuahua (Leopold 1959). Although it is possible that grizzly bears occurred in Durango, there is no conclusive evidence in historical times that document their presence.

The black bear (*Ursus americanus* Pallas, 1780) did occur in the highlands of the Sierra Madre Occidental in Durango, the last documented record we could find is a specimen killed in 1956 at Rancho Las Margaritas (Baker and Greer 1962). Delfín-Alonso *et al.* (2011) add four more records, the last one as recent as 2005. Unfortunately, they are personal communications with no evidence available to back them up. It is possible that the species still occurs in Durango, but a systematic effort would be necessary to verify its presence.

The pronghorn *Antilocapra americana* (Ord, 1815) was reported for the last time in the wild by Nelson (1925), from an area between Mapimí and Tlahualilo, in the northeastern portion of the state. Subsequent authors did not include it in the fauna of Durango (Ceballos and Navarro 1991), and we could not find recent records of pronghorns within the state; thus, we consider them as extirpated from Durango. The American bison *Bison bison* (Linnaeus, 1758) was mentioned by Allen (1876), who asserted that it was distributed in Durango in the XVI century. Nonetheless Pacheco (2005) considered that its historical distribution did not include Durango. We could find no evidence for the presence of *Bison bison* in Durango in historical times. Ceballos *et al.* (2005) reported american bisons as "critically endangered" in Mexico, because in the last 30 years the only confirmed record came from a small population observed near Janos, Chihuahua.

Additional Records

Baker and Greer (1962) suggested that the bighorn sheep (*Ovis canadensis* Shaw, 1804) occured at the Bolsón de Mapimí, northeastern Durango, based on a record by Baker (1956) from Sierra del Diablo, 20 miles (32 km) north of the border between the states of Chihuahua and Durango. Notwithstanding, we found no record of occurrence for that area or any other in Durango. Aragón

Piña and Garza Herrera (1999) reported the presence of *Myotis occultus* Hollister, 1909 (as *Myotis lucifugus* (Le Conte, 1831)) and *Erethizon dorsatum* (Linnaeus, 1758) at Mapimí Biosphere Reserve, but they did not provide specific localities. Because the reserve lays across three different states (Durango, Chihuahua, and Coahuila), it is not possible to determine with certainty the occurrence of these species in Durango. Aragón *et al*. (2009) reported *Sciurus niger* Linnaeus, 1758 and *Neotoma lepida* Thomas, 1893 for the municipality of Canatlán, central Durango. These reports need to be reevaluated, given that *N. lepida* is a woodrat known only from Baja California and northern Sonora, and *S. niger* is a species of squirrel that in Mexico is distributed only in northern Coahuila (over 500 km northeast from Canatlán). Furthermore, externally *S. niger* resembles *S. nayaritensis* J.A. Allen, 1890, a common squirrel in their study area (Hall 1981; Ceballos and Oliva 2005), and with which it could have been confused. Muñiz-Martínez *et al*. (2003) reported *Nyctinomops laticaudatus* (E. Geoffroy, 1805) for Durango, but a recent review of the specimens on which the report is based (CRD2497-2500), revealed that they are actually *N. femorosaccus* (Merriam, 1889). Finally, *Panthera onca* (Linnaeus, 1758) (Navarro-Serment *et al*. 2005), *Sigmodon mascotensis* J.A. Allen, 1897 (CRD774-776), and *Myotis fortidens* Miller and G.M. Allen, 1928 (Jones *et al*. 1972) have been recorded in localities less than 15 km from the border with Durango, and therefore are likely to occur within the state.

Distribution by ecological regions

Species richness (136, not including the 2 extirpated species and the black bear) was higher at the Quebradas (65), followed by the Valleys (62), the Sierra (57) and the Arid region (48). The cluster analysis (Figure 4) grouped Valleys and Sierra, which share almost half the species (43.37%), most of them of Nearctic affinities (mostly Vespertilionidae bats and Muridae rodents). This group is joined to the Arid region, with which it shares 30.41% of the species, mostly vespertilionids and some carnivores (Figure 4, Table 1). The Quebradas region is the most distinct, sharing only 17.87% of the species with the rest. This region includes mostly tropical elements that are lacking in the rest of the state, but are widely distributed in the Pacific coastal plain (Figure 4). From the 65 species occuring in this area, 7 are endemic to México (*Tlacuatzin canescens* (J.A. Allen, 1893), *Artibeus hirsutus* Andersen, 1906, *Myotis carteri* La Val, 1973, *Rhogeessa parvula* H. Allen, 1866, *Cynomops mexicanus* (Jones and Genoways, 1967), *Sciurus colliaei* Richardson, 1839, *Chaetodipus artus* (Osgood, 1900). The Quebradas and Arid regions share 16 species, even though they are separated by a 250 km-wide mountain range. Eight are widely distributed generalist species (e.g. *Eptesicus fuscus* (Beauvois, 1796), *Lasiurus cinereus* (Beauvois, 1796),), the rest are species that are distributed in arid and dry tropical environments (e.g. *Mormoops megalophylla* (Peters, 1864), *Choreonycteris mexicana* Tschudi, 1844).

The Sierra and Quebradas are contiguous areas that share mostly generalist species (13). *Dermanura azteca* (Andersen, 1906) and *Anoura geoffroyi* Gray, 1838, tropical species, have been captured in the highlands as well (Hernández Huerta 1996; CRD). They likely represent vagrants from the lowlands, but also it is possible that elevational, seasonal migrations may occur between the tropical and temperate areas of the Sierra Madre Occidental. This is a subject that remains to be investigated. We recorded 15 species only at the highlands of the Sierra Madre Occidental, 5 are endemic to the Sierra (*Callospermophilus madrensis* (Merriam, 1901), *Tamias bulleri* J.A. Allen, 1889, *T. durangae* (J.A. Allen, 1903), *Peromyscus schmidlyi* Bradley *et al*., 2004 and *Nelsonia neotomodon* Merriam, 1897) and four are endemic to México (*Corynorhinus mexicanus* G.M. Allen 1916, *Peromyscus difficilis* J.A. Allen, 1871, *Reithrodontomys zacatecae* Merriam, 1901 and *Sigmodon leucotis* Bailey, 1902).

The Arid zone (Chihuahuan Desert) is the least diverse, only 10 species occured exclusively there, two of them endemic to Mexico (*Dipodomys nelsoni* Merriam, 1907 and *Neotoma goldmani* Merriam, 1903). This region has a long history of agricultural and livestock activity, which has resulted in considerable fragmentation and habitat loss. The effects of these changes in the mammalian fauna have not been quantified.

The Valleys region includes mostly species of Nearctic affinities. Because of its being rather a transitional area between the aridlands to the east and the Sierra to the west, only one exclusive species occurs (*Dipodomys phillipsii* Gray, 1841). It presents, instead, a mixture of elements from the desert and the Sierra. Three species occurring in this region are endemic to Mexico (*Chaetodipus nelsoni* (Merriam, 1894), *Dipodomys phillipsii*, and *Peromyscus melanophrys* (Coues, 1874). As with the aridlands, the valleys have been strongly modified by agricultural and cattle ranching practices. Most of the original grasslands were replaced by pastures, and the area devoted to livestock has tripled in the last 30 years. In general, the landscape of the valleys is considered to have suffered from medium to high degree of modification (Márquez-Linares 2007). In the same way as the aridlands, the effect of these transformations in the mammalian fauna is unknown.

Final Remarks

Durango state is home to almost 30 % of the terrestrial mammal species known for Mexico. It is likely that the proportion will be similar for other zoological groups, and we know it is so at least for vascular plants (González-Elizondo *et al*. 1991). Durango is one of the most species rich states in Mexico, and includes both Nearctic and Neotropical species (López-González and García-Mendoza

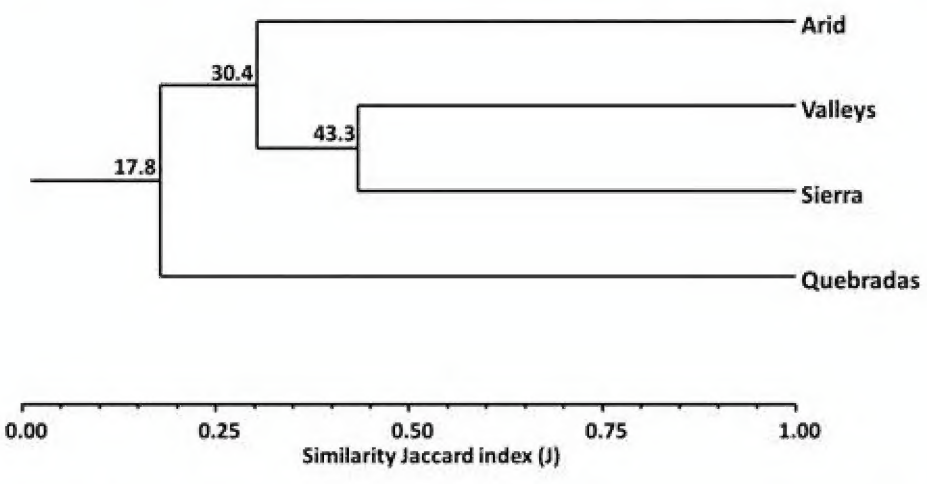

Figure 4. Cluster analysis (UPGMA) of mammalian species assemblages for four ecological regions in Durango, Mexico. The Jaccard index was used as a measure of similarity. Numbers on nodes indicate percentage of species shared by branches.

2007). Nonetheless, our knowledge on their local distribution, ecology, evolution, and response to anthropic modification is scant or nonexistent. This situation is worrying, especially because even though Durango is one of the largest states in Mexico, the proportion of its territory that is protected is minimal (2.04 %, Márquez-Linares 2007), and it does not include all the major ecoregions of the state. No protected area exists for the Quebradas region, although it is the most species-rich (Table 1) and the Mexican National Comission for Biodiversity (CONABIO) has designated as priorities for conservation five areas that include, at least partially, the Quebradas region (Arriaga *et al*. 2000). This is also one of the least studied areas, mainly due to its inaccesibility. A formal proposal for protecting these and other areas in the state already exists (Márquez-Linares 2007), and suggests a protected area that will cover up to 10.8 % of the state territory. At the current rate of modification, it is urgent to take this proposal to reality in order to ensure the persistence of Durango's unique diversity.

Table 1. Mammals recorded for the state of Durango, Mexico to 2012. Ar = Arid, Va = Valleys, Si = Sierra, Qu = Quebradas. * Species extirpated from the state. Conservation status as to NOM_ECOL 059-2001 (SEMARNAT 2001)/UICN: A= threatened, Pr= Special protection, E= Extinct, P= Endangered, VU= Vulnerable, EN= Endangered. Endemic species according to Ceballos and Oliva (2005). Regions as defined by González Elizondo *et al.* (2007); see text for details.

TAXON	REGION				MEXICO ENDEMIC	STATUS	SOURCE OF RECORDS
	Ar	Va	Si	Qu			
Order Didelphimorphia							
Family Didelphidae							
Subfamily Didelphinae							
Tlacuatzin canescens (J.A. Allen, 1893)				X	X		Baker and Greer (1962), CRD
Didelphis virginiana Kerr, 1792		X	X	X			Baker and Greer (1962), MSU, CRD, CNMA
Order Cingulata							
Family Dasypodidae							
Subfamily Dasypodinae							
Dasypus novemcinctus Linnaeus, 1758				X			Baker and Greer (1962), MSU
Order Soricomorpha							
Family Soricidae							
Subfamily Soricinae							
Sorex emarginatus Jackson, 1825			X		X		Baker and Greer (1962), KU, MSU, CRD, ENCB
Sorex monticolus Merriam, 1890			X				Baker and Greer, (1962), MSU
Sorex veraecrucis Carraway, 2007			X				Carraway (2007)
Notiosorex crawfordi (Coues, 1877)	X	X				A	Baker (1965), MSU, CRD
Order Chiroptera							
Family Emballonuridae							
Subfamily Emballonurinae							
Balantiopteryx plicata Peters, 1867				X			Torres-Morales *et al.* (2010), CRD
Family Mormoopidae							
Mormoops megalophylla (Peters, 1864)	X	X		X			Baker and Greer, (1962), MSU, CRD
Pteronotus parnellii (Gray, 1843)				X			Baker and Greer (1962), KU, CRD
Family Phyllostomidae							
Subfamily Macrotinae							
Macrotus californicus Baird, 1858				X			Baker and Greer (1962), KU, CRD
Subfamily Micronicterinae							
Glyphonycteris sylvestris Thomas, 1896[a]				X			CRD
Subfamily Desmodontinae							
Desmodus rotundus (É.Geoffroy St.-Hilaire, 1810)				X			Gardner (1963), KU, CRD, TTU
Subfamily Glossophaginae							
Anoura geoffroyi Gray, 1838			X	X			Baker and Greer (1962), MSU, CRD, CNMA
Choeronycteris mexicana Tschudi, 1844	X	X		X		A	Baker and Greer (1962), MSU, CRD, CNMA
Glossophaga commissarisi Gardner, 1962				X			Baker and Greer (1962), MSU, CRD
Glossophaga leachii Gray, 1844[a]				X			MSU, CRD
Glossophaga soricina (Pallas, 1766)				X			Baker and Greer (1962), KU, MSU, CRD
Leptonycteris yerbabuenae Martinez and Villa-Ramírez, 1940	X			X		A/VU	Crossin *et al.* (1973), MSU, KU, CRD
Leptonycteris nivalis (de Saussure, 1860)	X			X		A/EN	Arita and Humprey (1988), MSU, CRD, CNMA
Subfamily Stenodermatinae							
Artibeus hirsutus Andersen, 1906				X	X		Torres-Morales *et al.* (2010), CRD
Artibeus jamaicensis Leach, 1821				X			Baker and Greer (1962), MSU, CRD, TTU
Artibeus intermedius J.A. Allen, 1897				X			Torres-Morales *et al.* (2010), MSU, KU, CRD, CNMA TTU
Centurio senex Gray, 1842				X			Crossin *et al.* (1973), MSU
Chiroderma salvini Dobson, 1878				X			Crossin *et al.* (1973), MSU, CRD
Dermanura azteca (Andersen, 1906)			X	X			Baker and Greer (1962), MSU, CRD, CNMA

Table 1. ***Continued.***

TAXON	REGION				MEXICO ENDEMIC	STATUS	SOURCE OF RECORDS
	Ar	Va	Si	Qu			
Dermanura tolteca (de Saussure, 1860)				X			Baker and Greer (1962), MSU, CRD, CNMA
Dermanura phaeotis (Miller, 1902)				X			CNMA
Sturnira lilium (É. Geoffroy St.-Hilaire, 1810)				X			Baker and Greer (1962), MSU, CRD, TTU
Sturnira ludovici Anthony, 1824				X			Baker and Greer (1962), MSU
Family Natalidae							
Natalus lanatus Tejedor, 2005				X			Tejedor (2005), CRD
Natalus mexicanus Miller, 1902				X			Baker and Greer (1962)
Family Vespertilionidae							
Subfamily Vespertilioninae							
Corynorhinus mexicanus G. M. Allen, 1916			X		X		Muñiz-Martínez y Polaco (1996), CRD, CNMA
Corynorhinus townsendii (Cooper, 1837)	X	X	X				Baker and Greer (1962), MSU, CRD, CNMA
Eptesicus fuscus (Palisot de Beauvois, 1796)	X	X	X	X			Baker and Greer (1962), MSU, KU, CRD, CNMA, ENCB, TTU
Euderma maculatum (J.A. Allen, 1891)		X	X			Pr	Gardner (1965), ENCB, CNMA
Idionycteris phyllotis (G.M. Allen, 1916)		X	X				Gardner (1965), CRD, ENCB, CNMA
Lasiurus blossevillii (Lesson and Garnot, 1826)		X	X	X			Urbano-Vidales *et al.* (1987), CRD, CNMA
Lasiurus cinereus (Palisot de Beauvois, 1796)	X	X	X	X			Gardner (1965), MSU, CRD, CNMA, ENCB, TTU
Lasiurus xanthinus (Thomas, 1897)	X	X	X				Baker and Greer (1962), MSU, CRD, CNMA
Myotis auriculus Baker and Stains, 1955			X				Gardner (1965), CRD, ENCB, CNMA
Myotis californicus (Audubon and Bachman, 1842)	X	X	X	X			Gardner (1965), CRD, ENCB, CNMA
Myotis carteri LaVal, 1973				X	X	Pr	Torres-Morales *et al.* (2010), CRD
Myotis melanorhinus (Merriam, 1886)		X	X				Baker and Greer (1962), KU, CRD, CNMA, TTU
Myotis thysanodes Miller, 1897		X	X				Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Myotis velifer (J.A. Allen, 1890)	X	X	X	X			Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Myotis volans (H.A. Allen, 1866)		X	X				Gardner (1965), MSU, CRD, ENCB, CNMA, TTU
Myotis yumanensis (H.A. Allen, 1864)		X	X	X			Baker and Greer (1962), MSU, CRD, ENCB, CNMA, TTU
Parastrellus hesperus (H.A. Allen, 1864)	X	X		X			Baker and Greer (1962), MSU, CRD, CNMA
Rhogeessa parvula H. Allen, 1866				X	X		Gardner (1963), KU, CRD, CNMA
Subfamily Antrozoinae							
Antrozous pallidus (Le Conte, 1856)	X	X	X				Baker and Greer (1962), MSU, KU, CRD, CNMA
Family Molossidae							
Subfamily Molossinae							
Cynomops mexicanus (Jones and Genoways, 1967)				X	X	Pr	Muñiz-Martínez *et al.* (2003), CRD
Eumops perotis (Schinz, 1821)	X			X			Aragón-Piña and Garza Herrera (1999), CRD, CNMA
Molossus molossus (Pallas, 1766)				X			Muñiz-Martínez *et al.* (2003), CRD
Molossus rufus È. Geoffroy St.-Hilaire, 1805				X			Gardner (1963), KU, CRD
Nyctinomops femorosaccus (Merriam, 1889)				X			Gardner (1963), KU, CRD
Nyctinomops macrotis (Gray, 1839)				X			Gardner (1965), CRD
Subfamily Tadarinae							
Tadarida brasiliensis (I. Geoffoy Saint-Hilaire, 1824)	X	X	X	X			Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Order Carnivora							
Family Canidae							
Subfamily Caninae							
Canis latrans Say, 1823	X	X	X				Baker and Greer, (1962), MSU, KU, CRD, ENCB, CNMA
Canis lupus Linnaeus, 1758*			+			E	Baker and Greer, (1962), MSU
Urocyon cinereoargenteus (Schreber, 1775)	X	X	X	X			Baker and Greer, (1962), MSU, CNMA
Vulpes macrotis Merriam, 1888	X					A	Baker and Greer (1962), MSU, KU, ENCB, CNMA
Family Felidae							
Subfamily Felinae							
Leopardus pardalis (Linnaeus, 1758)				X		P	Servín, *et al.* (2003a)
Leopardus wiedii (Schinz, 1821)				X		p	Servín, *et al.* (2003a), MSU, CNMA
Lynx rufus (Schreber, 1777)	X	X	X				Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Puma concolor (Linnaeus, 1771)	X	X	X				Baker and Greer (1962), MSU, CNMA
Puma yagouaroundi (Lacépède, 1809)				X		A	Servín *et al.* (2003a), CNMA
Family Mustelidae							
Subfamily Lutrinae							
Lontra longicaudis (Olfers, 1818)		X	X	X		A	Baker and Greer (1962), CNMA
Subfamily Mustelinae							
Mustela frenata Lichtenstein, 1831		X					Baker and Greer (1962), MSU, CRD

TABLE 1. ***CONTINUED.***

TAXON	REGION				MEXICO ENDEMIC	STATUS	SOURCE OF RECORDS
	Ar	Va	Si	Qu			
Subfamily Taxidiinae							
Taxidea taxus (Schreber, 1778)	X	X				A	Baker and Greer (1962), MSU, CRD, CNMA
Family Mephitidae							
Conepatus leuconotus (Lichtenstein, 1832)		X					Baker and Greer (1962), MSU, CRD
Mephitis macroura Lichtenstein, 1832		X	X				Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Mephitis mephitis (Schreber, 1776)		X	X				Baker and Greer (1962), CRD
Spilogale gracilis Merriam, 1890			X	X			Baker and Baker (1975), MSU, CRD, CNMA
Family Procyonidae							
Subfamily Procyoninae							
Bassariscus astutus (Lichtenstein, 1830)	X	X		X			Baker and Greer (1962), MSU, CRD, CNMA
Nasua narica (Linnaeus, 1766)				X			MSU, CRD, CNMA
Procyon lotor (Linnaeus, 1758)		X	X	X			Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Family Ursidae							
Subfamily Ursinae							
Ursus americanus Pallas, 1780			?			P	Baker and Greer (1962), MSU
Order Artiodactyla							
Family Antilocapridae							
Subfamily Antilocaprinae							
Antilocapra americana (Ord, 1815)*	+	+				P	Nelson (1925)
Family Cervidae							
Subfamily Odocoileinae							
Odocoileus hemionus (Rafinesque, 1817)	X						Baker and Greer (1962), MSU, ENCB
Odocoileus virginianus (Zimmermann, 1780)		X	X	X			Baker and Greer (1962), MSU, CRD, CNMA
Family Tayassuidae							
Subfamily Tayassuinae							
Pecari tajacu (Linnaeus, 1758)		X	X	X			Baker and Greer (1962), MSU, CRD, CNMA
Order Rodentia							
Family Sciuridae							
Subfamily Sciurinae							
Ammospermophilus interpres (Merriam, 1890)	X						Baker and Greer (1962), MSU, KU
Callospermophilus madrensis (Merriam, 1901)			X		X	Pr	Servín *et al.* (1996), CRD, CNMA
Ictydomys mexicanus (Erxleben, 1777)	X						Aragón *et al.*, (1993), CNMA
Otospermophilus variegatus (Erxleben, 1777)	X	X	X	X			Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Sciurus aberti Woodhouse, 1853			X			Pr	Baker and Greer (1962), MSU, KU, CRD, CNMA
Sciurus colliaei Richardson, 1839				X	X		Baker and Greer (1962), KU, CNMA
Sciurus nayaritensis J.A. Allen, 1890			X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Tamias bulleri J.A. Allen, 1889[b]			X		X	VU	Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Tamias dorsalis (Baird, 1855)[b]			X				Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Tamias durangae (J. A. Allen, 1903)[b]			X		X		Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Xerospermophilus spilosoma Bennett, 1833	X	X					Baker and Greer (1962), MSU, KU, CRD, CNMA
Family Geomyidae							
Subfamily Geomyinae							
Cratogeomys castanops (Baird, 1852)	X						Baker and Greer (1962), CNMA
Thomomys umbrinus (Richardson, 1829)	X	X	X	X			Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Family Heteromyidae							
Subfamily Heteromyinae							
Liomys irroratus (Gray, 1868)	X	X					Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Liomys pictus (Thomas, 1893)				X			Baker and Greer (1962), MSU, CRD, CNMA, TTU
Subfamily Perognathinae							
Chaetodipus artus (Osgood, 1900)				X	X		Baker and Greer (1962), KU
Chaetodipus eremicus (Mearns, 1898)	X	X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Chaetodipus hispidus (Baird, 1858)	X						Baker (1965), MSU, CRD, CNMA
Chaetodipus nelsoni (Merriam, 1894)	X	X			X		Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Chaetodipus pernix (Woodhouse, 1852)				X			KU, CRD
Perognathus flavus Baird, 1855	X	X					Baker and Greer (1962), MSU, KU, CRD, TTU
Subfamily Dipodomyinae							
Dipodomys merriami Mearns, 1890	X						Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Dipodomys nelsoni Merriam, 1907	X				X		Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA

TABLE 1. ***CONTINUED.***

TAXON	REGION				MEXICO ENDEMIC	STATUS	SOURCE OF RECORDS
	Ar	Va	Si	Qu			
Dipodomys ordii Woodhouse, 1853	X						Baker and Greer (1962), MSU, KU, CRD
Dipodomys phillipsii Gray, 1841		X			X	Pr	Baker and Greer (1962), MSU, KU, CRD, TTU
Dipodomys spectabilis Merriam, 1890	X						Servín *et al.* (2003a), CRD
Family Muridae							
Subfamily Arvicolinae							
Microtus mexicanus (de Saussure, 1861)			X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Subfamily Neotominae							
Baiomys taylori (Thomas, 1887)		X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Nelsonia neotomodon Merriam, 1897			X		X	Pr	Baker and Greer (1962), MSU, CRD, ENCB, CNMA
Neotoma goldmani Merriam, 1903	X				X		Baker and Greer (1962), MSU, KU, ENCB
Neotoma leucodon Merriam, 1894	X	X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Neotoma mexicana Baird, 1855		X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Onychomys arenicola Mearns, 1896	X	X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus boylii (Baird, 1855)		X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Peromyscus difficilis (J.A. Allen, 1891)			X		X		Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus eremicus (Baird, 1858)	X	X		X			Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus gratus Merriam, 1898		X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus leucopus (Rafinesque, 1818)		X					Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Peromyscus maniculatus (Wagner, 1845)	X	X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus melanophrys (Coues, 1874)		X			X		Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus melanotis J.A. Allen and Chapman, 1897			X				Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Peromyscus pectoralis Osgood, 1904	X	X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Peromyscus schmidlyi Bradley et al., 2004			X		X		Bradley *et al.* (2004), CRD, ENCB, CNMA, TTU
Peromyscus spicilegus J.A. Allen, 1897				X	X		Baker and Greer (1962), MSU, CRD, CNMA, TTU
Reithrodontomys fulvescens J.A. Allen, 1894		X		X			Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Reithrodontomys megalotis (Baird, 1858)		X					Baker and Greer (1962), MSU, CRD, CNMA, TTU
Reithrodontomys montanus (Baird, 1855)	X						Baker and Greer (1962)
Reithrodontomys zacatecae Merriam, 1901			X		X		Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA, TTU
Subfamily Sigmodontinae							
Sigmodon arizonae Mearns, 1890				X			Baker and Greer (1962), MSU, KU, CRD, CNMA, TTU
Sigmodon fulviventer J.A. Allen, 1889		X	X				Baker and Greer (1962), MSU, CRD, CNMA, TTU
Sigmodon hispidus Say and Ord, 1825	X	X					Baker and Greer (1962), MSU, KU, CRD
Sigmodon leucotis Bailey, 1902			X		X		Baker and Greer (1962), MSU, CRD, ENCB, CNMA, TTU
Sigmodon ochrognathus Bailey, 1902		X					Baker and Greer (1962), MSU, CRD, TTU
Order Lagomorpha							
Family Leporidae							
Lepus californicus Gray, 1837	X	X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Lepus callotis Wagler, 1830		X	X				Baker and Greer (1962), MSU, KU, CRD
Sylvilagus audubonii (Baird, 1858)	X	X					Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
Sylvilagus floridanus (J.A. Allen, 1890)		X	X				Baker and Greer (1962), MSU, KU, CRD, ENCB, CNMA
TOTAL	**48**	**62**	**57**	**65**	**23**	**20**	

a - Previously unpublished records from museum specimens.
b - Though recently pooled in one single taxon (Piaggio and Spicer 2001) morphological evidence (CRD unpublished data) does not support this decision, and therefore we keep them as separate species.

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